

REMARKS/ARGUMENTS

The courteous telephone interview granted applicants' undersigned attorney by Examiner Ng on August 12, 2008 is hereby respectfully acknowledged. The Examiner generally agreed that the cited references do not disclose the claimed invention. As requested by the Examiner, the arguments presented in the interview are set forth below.

Claims 1, 3, 5-12, 16-18, and 20-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,625,161 (Su et al.) in view of U.S. Patent No. 6,731,639 (Ors et al.). Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al. in view of Ors et al., and further in view of U.S. Patent No. 6,728,268 (Bird). Claim 24 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Su in view of Ors, and further in view of U.S. Patent No. 6,795,862 (Doty, Jr.). For the reasons set forth below, applicants request reconsideration of the pending rejections.

Applicants' invention is directed to a method and system for defining hardware routing paths in a network having both IP paths and MPLS paths. The IP and MPLS paths are organized, sorted, and compared in a uniform manner so that maximum hardware path resource utilization can be achieved. Claim 1, for example, includes assigning a unique path ID for each path within a path group, comparing all path IDs in each path group, and assigning a common hardware resource to groups having matching path IDs. The path ID for each path includes an IP address. Claims 1, 12, and 17 specify that path information is received for a plurality of paths in a path group, the path group comprising both IP and MPLS paths, and that each of the IP paths is represented by an IP address and each of the MPLS paths represented by a label. The MPLS path is represented by a label but still assigned an IP address to conform to the format of the IP paths.

As described in detail below, none of the cited references, either alone or in combination, show or suggest assigning a unique path ID comprising an IP address for each path within a group containing both IP and MPLS paths. Moreover, none of the references teaches assigning a unicast IP address to IP paths and an IP multicast address to MPLS paths, as set forth in the claims.

Su et al. disclose a system which examines a continuous stream of packets departing from a network to identify predetermined common criteria or attribute. Su et al. do not discuss paths within the network or assign an IP address to a path, as set forth in the claims. In rejecting the claims, the Examiner refers to col. 4, lines 62-67 of Su et al. This section of the patent describes how packets containing a common destination IP address are grouped together. The Examiner also cites col. 5, lines 59-63. This section of the patent describes a hash value used in a mapping function. Rather than assigning an IP address for a group, Su et al. use a hash value. Since the hash value is not an IP address, it cannot be compared to other IP addresses, as set forth in the claims. In claim 1, for example, the path ID assigned for each IP path comprises a unicast IP address and the path ID assigned for each MPLS path comprises a multicast IP address. This allows all path IDs in each path group (containing both IP and MPLS paths) to be compared.

As noted by the Examiner, Su et al. also do not disclose receiving path information for a path group comprising both IP and MPLS paths, defining hardware routing paths in a network having both IP paths and MPLS paths, comparing path IDs in a path group containing both IP and MPLS paths, or assigning a unique IP multicast address for MPLS paths.

The Ors et al. patent does not show or suggest assigning a unique IP multicast address for each MPLS path. The Ors et al. patent is directed to MPLS for multiple access segments. As the Examiner notes in the rejection, the switching node of Ors et al. assigns a multicast *label* to each MPLS path in the network. Ors et al. do not assign an IP multicast address for each MPLS path, as required by the claims. In contrast to

applicants' invention, Ors et al. assign a label to each MPLS path and perform conventional packet forwarding based on label information. Applicants' invention, as set forth in the claims is not using an IP multicast address to deliver packets in a multicast system. Instead the claimed invention uses a unique IP multicast address for each path ID of a MPLS paths so that these paths can be compared with other IP addresses at the network device (e.g., router).

Furthermore, the cited references do not show or suggest assigning a common hardware resource to groups having matching path IDs. The hardware resource may be, for example, a resource of the hardware assisted forwarding engine. It is this common hardware resource at the network device that is assigned to groups having matching path IDs (IP addresses). In rejecting the claims, the Examiner refers to assigning a traffic aggregate to a communication channel for communication within the network. In contrast, the claimed invention assigns a common hardware resource at the network device. Thus, the same hardware resource may be used to make a forwarding decision (e.g., perform lookups) for groups having matching path IDs.

With conventional systems, IP paths are based on an IP address (Su et al.) and MPLS paths are based on an MPLS label (Ors et al.). Therefore, if paths contain both IP and MPLS paths, the hardware paths must contain different information in order to forward the packets onto MPLS or IP paths. Thus, each route requires independent hardware path resources to support IP and MPLS mixed load sharing paths. In contrast to the cited references, applicants' claimed invention assigns a unique path ID comprising a unicast IP address for an IP path, and a multicast IP address for an MPLS path. Since IP paths and MPLS paths are *both* assigned an IP address (path ID) in the claimed invention, these addresses can be compared and a common hardware resource assigned to groups having matching addresses (path IDs), wherein the groups contain both IP and MPLS paths.

In particular, the invention defined by claim 1 requires assignment of a unique path ID containing an IP address for each path within a path group. There is no

teaching or suggestion in either reference of assigning an IP address as a path ID for an MPLS path. Without a common identifier for the IP and MPLS paths, there is no way to compare the path IDs or assign a common hardware resource. Applicants' invention, as set forth in the claims, provides a uniform way of handling IP and MPLS paths.

Accordingly, claims 1, 12, and 17, and the claims depending therefrom, are submitted as patentable over Su et al. and Ors et al.

With regard to claims 5 and 6, Ors et al. do not disclose assigning a unique IP address from an internal managed group of IDs. Ors et al. obtain an MPLS label from an MPLS database containing label routing information. The MPLS label is obtained from the database for use in a packet to be sent over a route as broadcasted by the switching node.

With regard to claims 7 and 8, Ors et al. do not assign an IP address for each MPLS path entity. Instead, Ors et al. obtain a MPLS label, as previously discussed.

With regard to claim 24, as noted by the Examiner neither Su et al. nor Ors et al. disclose wherein IP multicast addresses each comprise a common prefix that is different than a prefix of unicast IP addresses and path IDs. With respect to this limitation, the Examiner cites Doty, Jr. The Doty, Jr. patent describes a device for combining streaming video with e-mail. The Examiner refers to col. 2, line 56 - col. 3, line 3 of Doty, Jr. This section of the patent describes different types of transmission schemes (unicast, multicast, UDP) and conventional multicast IP addresses ranging from a prefix of 224-239. Doty, Jr. does not disclose assigning IP multicast addresses with a common prefix. Instead, Doty, Jr. simply refers to an available range of prefixes. None of the cited references teach assigning a multicast address to MPLS paths or assigning a common prefixes to select paths. Furthermore, none of the cited references teaches assigning addresses to a first type of path (e.g., MPLS), wherein these addresses have a different prefix than the addresses assigned to another type of path (e.g., IP).

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The other references cited including U.S. Patent No. 6,728,268 (Bird), do not overcome the deficiencies of the primary references discussed above.

For the foregoing reasons, Applicants believe that all of the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (408) 399-5608.

Respectfully submitted,



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